CCE-III-RR/PR/PF/NSR/NSPR(A)/111/7143

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ಆಗಸ್ಟ್ 2024 ರ ಪರೀಕ್ಷೆ-3
AUGUST 2024 EXAMINATION-3

ಒಟ್ಟು ಮುದ್ರಿತ ಪುಟಗಳ ಸಂಖ್ಯೆ : 16]

Total No. of Printed Pages : 16]

ಒಟ್ಟು ಪ್ರಶ್ನೆಗಳ ಸಂಖ್ಯೆ : 38]

Total No. of Questions : 38]

CCE RR/PR/PF/ NSR/NSPR FULL SYLLABUS

Question Paper Serial No.

ಸಂಕೇತ ಸಂಖ್ಯೆ : **81-E**

Code No. : 81-E

ವಿಷಯ : ಗಣಿತ

Subject : MATHEMATICS

(ಆಂಗ್ಲ ಮಾಧ್ಯಮ / English Medium)

(ಶಾಲಾ ಪುನರಾವರ್ತಿತ ಅಭ್ಯರ್ಥಿ / ಖಾಸಗಿ ಪುನರಾವರ್ತಿತ ಅಭ್ಯರ್ಥಿ / ಖಾಸಗಿ ಅಭ್ಯರ್ಥಿ / ಎನ್.ಎಸ್.ಆರ್. / ಎನ್.ಎಸ್.ಪಿ.ಆರ್.)

(Regular Repeater / Private Repeater / Private Fresh / NSR / NSPR)

ದಿನಾಂಕ : 08. 08. 2024] [Date : 08. 08. 2024

ಸಮಯ : ಬೆಳಗ್ಗೆ 10-15 ರಿಂದ ಮಧ್ಯಾಹ್ನ 1-30 ರವರೆಗೆ] [Time : 10-15 A.M. to 1-30 P.M.

ಗರಿಷ್ಠ ಅಂಕಗಳು : 80] [Max. Marks : 80

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General Instructions to the Candidate :

1. This question paper consists of 38 questions in all.
2. This question paper has been sealed by reverse jacket. ***You have to cut on the right side to open the paper*** at the time of commencement of the examination ***(Follow the arrow)***. **Do not cut the left side to open the paper.** Check whether all the pages of the question paper are intact.
3. Follow the instructions given against the questions.
4. Figures in the right hand margin indicate maximum marks for the questions.
5. The maximum time to answer the paper is given at the top of the question paper. It includes 15 minutes for reading the question paper.
6. Ensure that the Version of the question paper distributed to you and the Version printed on your admission ticket is the same.

08. 08. 2024

TEAR HERE TO OPEN THE QUESTION PAPER
ಪ್ರಶ್ನೆಪತ್ರಿಕೆಯನ್ನು ತೆರೆಯಲು ಇಲ್ಲಿ ಕತ್ತರಿಸಿ

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I. ***Four*** **alternatives are given for each of the following questions / incomplete statements. Choose the correct alternative and write the complete answer along with its letter of alphabet.** **8 × 1 = 8**

1. The degree of the cubic polynomial is

   (A) 1 (B) 2

   (C) 3 (D) 4

2. The discriminant of the quadratic equation $ax^2 + bx + c = 0$ is

   (A) $b^2 - 4ac$ (B) $c^2 - 4ab$

   (C) $b^2 + 4ac$ (D) $a^2 + 4ab$

3. $(\sec^2 A - 1)$ is equal to

   (A) $\tan^2 A$ (B) $\cot^2 A$

   (C) $\sin^2 A$ (D) $\text{cosec}^2 A$

4. $7 \times 11 \times 13 + 13$ is a

   (A) Prime number

   (B) Composite number

   (C) Irrational number

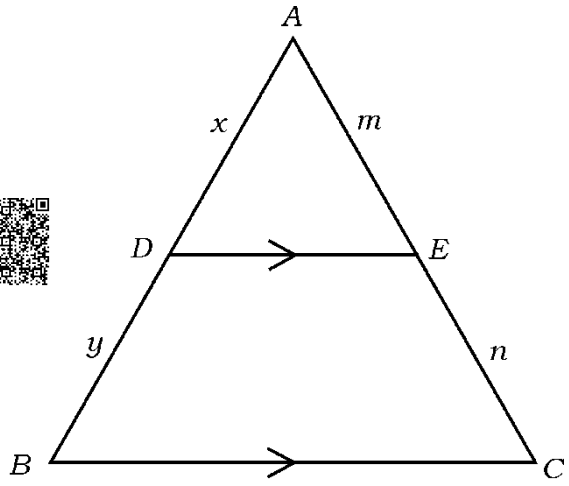
   (D) Odd number

5. If the pair of lines represented by linear equations $x + ky = 4$ and $2x + 4y = 12$ are parallel lines then the value of 'k' is

(A) – 2 (B) 2

(C) 4 (D) – 4

6. In the figure $DE \parallel BC$. If $AD = x$, $BD = y$, $AE = m$ and $CE = n$, then the correct relation among the following is



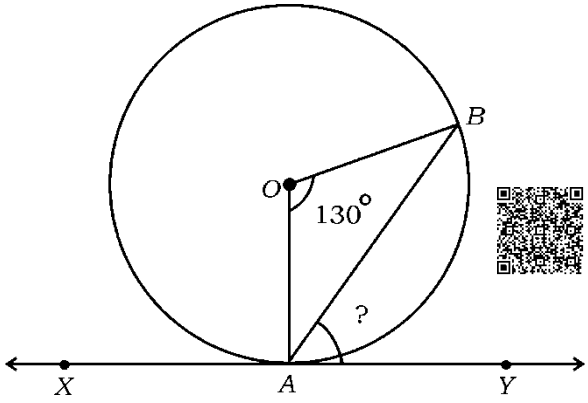
(A) $\frac{x}{y} = \frac{m}{m+n}$

(B) $\frac{x}{y} = \frac{n}{m}$

(C) $\frac{x+y}{x} = \frac{m}{m+n}$

(D) $\frac{x}{x+y} = \frac{m}{m+n}$

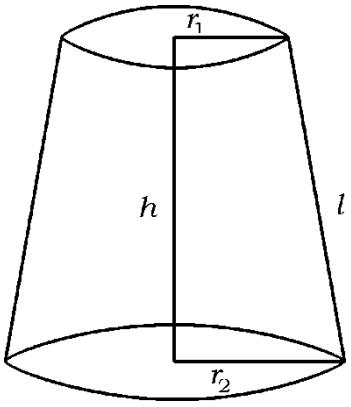
7. In the figure XY is a tangent to the circle with centre 'O'. If $\angle AOB = 130°$, then the measure of $\angle BAY$ is



(A) 90° (B) 25°

(C) 50° (D) 65°

8. The formula to find the curved surface area of a frustum of a cone in the given figure is



(A) $A = \pi (r_1 - r_2) l$

(B) $A = \pi (r_1 + r_2) l + \pi r_1^2$

(C) $A = \pi (r_1 + r_2) l$

(D) $A = \frac{1}{3} \pi h (r_1^2 + r_2^2 + r_1 r_2)$

II. Answer the following questions : **8 × 1 = 8**

9. Write the formula to find the n^{th} term of the arithmetic progression with first term *'a'* and common difference *'d'*.

10. If the product of zeroes of the polynomial $f(x) = 2x^2 - 3x + k$ is 3, then find the value of *'k'*.

11. A person buys 3 bats and 2 balls by paying Rs. 960. If a bat costs Rs. 300, then find the cost of one ball.

12. If $P(A) = 80\%$ then show that the probability of not A is $\frac{1}{5}$.

13. Write the formula to find the volume of a sphere having radius *'r'* units.

14. Express the denominator of $\frac{17}{40}$ in the form $2^m \times 5^n$ and find the value of *'n'*.

15. Find the value of cosec (90° – θ) × cos θ.

16. If sin θ = 1, then find the value of cos θ.

III. <u>Answer the following questions</u> : **8 × 2 = 16**

17. Prove that $2 + \sqrt{3}$ is an irrational number.

OR

Find the H.C.F. and L.C.M. of 3, 8 and 15.

18. Solve the given pair of linear equations by Elimination method :

$x + 2y = 5$

$x - y = 2$

19. Find the sum of first 20 terms of the arithmetic progression 2, 5, 8, ... using formula.

20. Find the roots of the equation $x^2 - 3x + 1 = 0$ using 'quadratic formula'.

21. If $\frac{\sqrt{3}\sec A}{\text{cosec } A} = 1$, then find the value of A.

OR

Prove that :

$$\sin 30° \cdot \cos 60° + \cos 30° \cdot \sin 60° = \sin 90°$$

22. Find the coordinates of the point which divides the line segment joining the points (– 1, 7) and (4, – 3) internally in the ratio 2 : 3.

23. A bag contains cards bearing the numbers 2, 4, 8, 16, 32, 64, 128 and 256. One card is drawn at random from the bag. Find the probability that the card bears a perfect cube number.

24. Draw a circle of radius 3 cm and construct a pair of tangents to the circle such that the angle between them is 70°.

IV. <u>Answer the following questions</u> : **9 × 3 = 27**

25. Divide $p(x) = x^3 - 3x^2 + 3x - 5$ by $g(x) = x^2 - x + 1$ and find the quotient [$q(x)$] and remainder [$r(x)$].

26. A train travels 360 km at a uniform speed. If the speed had been 5 km/h more, it would have taken 1 hour less for the same journey. Find the speed of the train.

OR

If the discriminant of the quadratic equation $x + \frac{1}{x} = \frac{10}{k}$ is zero, then find the value of *'k'*.

27. Prove that "The lengths of tangents drawn from an external point to a circle are equal".

28. The mid-point of the line segment joining the points $A(x, 0)$ and $B(0, y)$ is $(4, 3)$. Find the length of AB.

OR

Find the area of a triangle whose vertices are $A(5, 2)$, $B(4, 7)$ and $C(7, -4)$.

29. Find the mean for the following data :

Class-interval	*Frequency*
10 – 20	2
20 – 30	5
30 – 40	6
40 – 50	5
50 – 60	2

OR

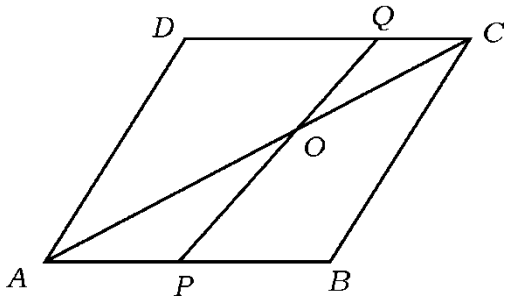
Find the mode for the following data :

Class-interval	*Frequency*
0 – 5	4
5 – 10	10
10 – 15	6
15 – 20	4
20 – 25	5

30. During the medical check-up of 50 students of a class, their weights were recorded as follows. Draw a "more than type ogive" for the given data :

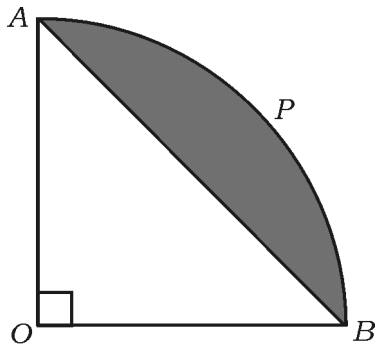
Weight (in kg)	*Number of students (cumulative frequency)*
20 or more than 20	50
25 or more than 25	40
30 or more than 30	25
35 or more than 35	20
40 or more than 40	10
45 or more than 45	5

31. In the figure, *ABCD* is a parallelogram. Point *'P'* divides *AB* in the ratio 2 : 3 and *'Q'* divides *DC* in the ratio 4 : 1. Prove that $OA = 2 \times OC$.



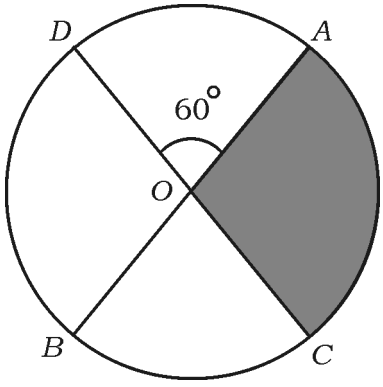
32. Construct a triangle with sides 5 cm, 6 cm and 7 cm and then construct another triangle whose sides are $\frac{4}{3}$ of the corresponding sides of first triangle.

33. The perimeter of a quadrant of a circle with centre *'O'* is 25 cm. Find the area of the shaded region.



OR

In the figure, diameters *AB* and *CD* intersect at *'O'*. If length of the arc *BC* = 22 cm and $\angle AOD = 60°$, then find the area of the sector *AOC*.



V. Answer the following questions : **4 × 4 = 16**

34. A person works in a shop from Monday to Saturday. His everyday earnings are in an arithmetic progression. His total earnings from Monday to Wednesday is Rs. 525 and Friday he gets Rs. 100 more than his Monday's earning. Find his everyday's earning.

OR

The angles of a quadrilateral are in arithmetic progression. If the sum of a pair of opposite angles is 130°, then find the angles of the quadrilateral.

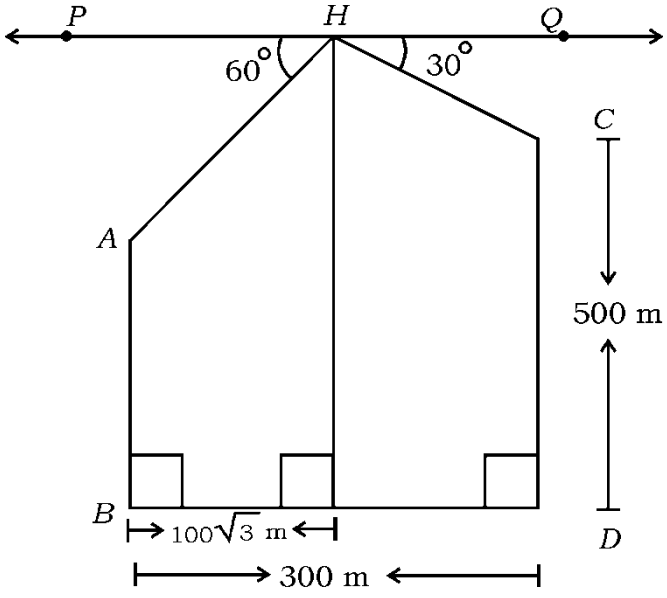
35. Find the solution of the given pair of linear equations by graphical method :

$x + y = 4$

$x + 2y = 6$

36. There are two vertical towers on a level ground which are 300 m apart. A soldier in an helicopter above the ground observes the top of the towers and he found the angles of depression to be 60° and 30° as shown in the figure. If the height of the taller tower is 500 m and the distance between the foot of the shorter tower and the foot of the altitude from the helicopter to the ground is $100\sqrt{3}$ m, then find the height of the shorter tower.

[Take $\sqrt{3}$ = 1·73]



37. Prove that "In a right triangle, the square of the hypotenuse is equal to the sum of the squares of the other two sides".

VI. Answer the following question : **1 × 5 = 5**

38. The volume of a cylinder is equal to 5 times the volume of a cone. The base radius and slant height of the cone are 7 cm and 25 cm respectively. If the radius of the circular base of the cylinder is 14 cm, then find the volume and curved surface area of the cylinder.